In the following, I will outline some suggestions and observations I had while reading the Chesapeake Bay TMDL document. To provide perspective, I am a Masters of Science in Environmental Studies student at Virginia Commonwealth University. What I am speaking of is mostly in the context of Virginia, and specifically the James River. However I feel that the suggestions are applicable to the entire Bay. For starters, I will address Sediment issues.

In the backstop allocations for the different Bay states, all but Maryland and the District of Columbia had point source requirements that mandate all construction land to be subject to sediment and erosion control by a general permit. This however disregards the fact that states like Virginia have these permits but have poor enforcement. There is no "first-step" state level permitting, monitoring, or complaint agency responsible for this. Instead in Virginia, the local governments are responsible for granting the construction permits and are responsible for monitoring and responding to complaints. As a second step if no response is made to a complaint, then concerned citizens can call the local Virginia DEQ office to address it. This not only disregards the fact that local governments, especially in fiscally challenging times, have more incentive to bring development to their governance, but more importantly, local authorities of limited resources and potentially little training are in charge of these permits and the monitoring of compliance. Based on many of my own personal simple roadside, easy access construction site observations, it appears as if they are unable or unwilling to enforce simple installment of silt fences. If anything, there should be more funded and trained enforcement, ideally managed by state level officials. Furthermore, surface or deep mining practices, drilling/exploration for oil and gas (inclusive of the associated roads and off-site disposal areas), tilling, planting, or harvesting of agricultural, forestry, and horticultural crops, livestock feedlots, and railroad construction are in fact *exempt* from construction permits in Virginia according to the DEQ. Including these sources and increasing enforcement of regulations will help accomplish what the construction permits actually seek to achieve. Otherwise, the backstop allocations will be as dysfunctional as the original WIPs.

With regards to SAV/water clarity, I understand the complications and lack of data associated with modeling and that nutrient TMDLs indirectly lower sediment TMDLs, however to make the rivers hosts to the aquatic life that frequents the area, some attention needs to be directed towards legacy sediment. In the entire TMDL document, I found no such mention of what to do with legacy sediments that have accumulated in the river basins as the watershed lands were historically clear cut and unsustainably farmed. These legacy sediments that accumulated over the centuries since the colonial tobacco era are perpetually resuspended by the daily tides, allowing for little net discharge of total sediments. The tidal resuspension of sediment clouds the water, impeding SAV reestablishment and therefore perpetuates the cycle because of the lack of SAV roots stabilizing the substrate. Additionally the tidal resuspension smothers essential habitat, including that of the Atlantic Sturgeon and the Eastern Oyster. Even with the most ideal sediment discharge from the tributaries, this issue will persist. Therefore, with the goals of reestablishing SAV and hosting the aquatic life to levels that historically inhabited the area, the TMDL document cannot disregard this very important source of sediment pollution.

The fact that legacy sediments are long-term residents of the tributary estuaries is reinforced by the necessity for frequent channel dredging by the USACE. On the topic of dredging, I would also like to add that there is no mention of regulations for dredging in the document either. While legacy sediments are an ignored source of sediment pollution, dredging acts to exacerbate and amplify this ignored source of suspended sediment by resuspending large amounts of sediment every dredging. While it does remove sediment, there should be strict guidelines regarding when it can be done, and how frequent. If anything, winter months would be ideal given higher river discharge and the greater potential for that to flush out resuspended sediments. Additionally, during winter months, the anadromous fish with struggling or at risk populations that make the spring-fall fishing so famous and sought after will be in the ocean out of harms way. These restrictions should not only be for the USACE but also for any landowners/companies on the shores of these rivers. All dredging activities (especially private dredging activities) should be monitored by regulatory agencies to ensure proper disposal and proper attention to reducing the impact of resuspension.

With relation to the modeling process, there was no mention of population growth and what that would do to land use changes and water demand. I understand the difficulty and added complexity of predicting land use change, but given the fact that urban development has increasingly become a major contributor to Bay nutrient and sediment pollution, this potential should have been explored. Also, as population grows, which in Virginia it is expected to grow a great deal, the issue of increased water demand seemed to be ignored in the modeling. The chosen 10 year hydrologic period may be complicated if water tables yield lower than expected flow. While this may decrease runoff, future development may counteract that with increased impervious surfaces. Therefore, the potential for sudden high discharge events (with urban sediment and nutrient pollution) associated with more impervious surface coupled with drasticlaly lower discharges in summer when vegetation and human demand for water will be at its highest, a recipe for greater summer hypoxia is possible. Given that, I think that the modeling process should have addressed the issue of population growth.

Moving to the issue of the airshed and atmospheric deposition of nutrients, the fact that the Chesapeake Bay TMDL addresses this issue with EPA plans to exercise Clean Air Act regulations seems inadequate. I have read that car exhaust onto roads when oxidized, washed with storm water, and or microbially converted become biologically available as nutrients and therefore act as point source nutrient pollution. These point sources, at least within Virginia, are already inspected annually. If the annual inspections could regulate nitrogen oxide in the exhaust, then that would cut down on a direct source. While the general public already complains about safety inspections and may not favorably view this, there could be a small fine that is paid when standards aren't met. The money from that fine could be used to subsidize pollution control devices on resident cars. Similarly, there are many coal power plants and other industrial smoke stacks in and around the Chesapeake Bay watershed, well within the airshed. Determining the power plant and industrial smoke stacks that atmospherically deposit in the watershed most of the year, regardless of which way the wind is blowing, would zero in on the most responsible large scale atmospheric depositors of nutrients. It would be very sensible to follow that because of their proximity to the Bay waters, they are directly related to the atmospheric deposition of nutrients into the Bay waters. Therefore, the

same regulations that apply to point source dischargers of water should apply to them, treating the smoke stacks themselves as end-of-pipe discharges of nutrients. While the technology may be lacking, the same programs that take place in Virginia with regards to nutrient trading among point source water dischargers could be applied to the point source industrial and power plant smoke stacks, just under an immediate airshed basis instead of watershed basis.

In the executive summary it addressed the 2-year milestones. My feeling is that while they may provide insight into goal attainment, there is no mention as to how nonpoint source non-attainment will be addressed. Many agricultural areas are managed under BMPs, but sourcing areas that need more attention is not addressed. In other words, there is no proposed way to source the nonpoint source problem areas. Monitoring 3rd order stream sub basins, normalizing the pollution levels by relating them to standard average nutrient/sediment loads divided by discharge would allow problem areas to stand out either through exceeding the average, or not changing from the average. Third order sub basins in some cases may be large components of, or in some instances the entire basin. Regardless, it would be a practical level to monitor especially in the James and very extensive Susquehanna. Additionally, because it breaks up the non-tidal basins into manageable sections it might offer incite into where new development and atmospheric sources play the greatest roles. Increasing the resolution, it allows for more adequate monitoring and data collection on changes affecting the landscape. While some WIPs may address this, this should be a standard for all Bay states so that the data that come into the modeling programs continue to be based on the same standard.

Finally, with relation to some proofreading and clarity issues in the document, I'd first like to bring to attention that in Section 6.1.2 the document directs the reader to Appendix F for more detailed technical documentation on deciding critical conditions for chlorophyll a and water clarity/SAV. However in Appendix F (titled "Determination of the Hydrologic Period for Model Application") there is no mention of chlorophyll a or water clarity/SAV critical conditions. Instead, the only mention of critical conditions is in relation to addressing the hydrologic period, when it says, "It is not to be confused with critical period of high stress." Instead, the correct information is found in Appendix G, which is titled "Determination of Critical Conditions for the Chesapeake Bay Total Maximum Daily Load (TMDL)." Additionally, I noticed two simple typos that may be something the writers would like pointed out. On page 5 of the executive summary in the third line of the third paragraph up from "Accountability and Goals" it says, "...the allocations happen to be more stringent **that** the allocations identified above." Here, I am sure that the word "than" was intended, but I figured it was worth sharing. Also, in Appendix J on the top of page 3 the first word in the fourth line says "bu" when I am sure the intended word was "by." I understand that is simple silly repairs, but figured you might like to know.

Finally, I recognize that I may have over looked some details and made recommendations that may already be in the proposed Chesapeake Bay TMDL. I have read every section that I could infer was related to the issues I was curious about (that which I discussed above). To do this, I would either go through the index of the entire document, use the search option of the actual PDFs, or the search "this area" option on the EPA website for the Chesapeake Bay TMDL. If in fact I have missed information that may be embedded within the actual document and appendices, then I apologize for

my ignorance, but would recommend that it be investigated. I only recommend this investigation because I would like to believe I did an exhaustive search and extensive reading to investigate my own curiosities. Perhaps the reason I may have missed certain elements may be due to the manner in which it is organized or written. Given that, I do admit that some of the very technical appendices, specifically those related to modeling and statistical analyses were a bit over my head. Admitting my basic lack of understanding there, it still may be worthwhile, especially with regards to effective communication and layman trust, to attempt to make it more clear in the final draft. Whatever the case, I am glad to see this document and TMDL allocations on the frontier. The work seems extensive and well done!